

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Inventor: Akihiko NISHIO et al.

Group Art Unit: 2618

Appln. No.: 10/528,120

Examiner: J. Young

Filed: March 16, 2005

Conf. No. 8910

For: METHOD FOR CONTROLLING TRANSMIT POWER AND BASE STATION
APPARATUS

RESPONSE UNDER 37 CFR § 1.111

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated August 1, 2008, the Applicants respectfully request reconsideration and allowance of this application in light of the following remarks.

Claims 2-6 and 8-11 stand rejected, under 35 USC §103(a), as being unpatentable over Voyer (US 2001/0027112) in view of Nakano et al. (US 5,933,782). Claim 7 stands rejected, under 35 USC §103(a), as being unpatentable over Voyer in view of Kumar et al. (US 6,434,367). The Applicants respectfully traverse these rejections based on the following points.

The Applicants note that the Office Action states that claims 2-6 and 8-11 are rejected over Voyer in view of Takano et al. (US 2002/0187786). However, the Office Action's citations of Takano actually point to disclosures within Nakano and are the same citations to Nakano identified in the Final Rejection dated May 21, 2007. Moreover, the Office Action cites Takano's

column and line numbers, although Takano is a patent application publication having paragraph numbers rather than column and line numbers. Therefore, the Applicants presume herein that the Office intended to apply Nakano rather than Takano in the rejections of claims 2-6 and 8-11.

If the above interpretation is incorrect, the Examiner is requested to issue a new office action in which the rejections are clarified.

The Applicants further note that the pending rejections of claims 2, 3, and 7 are identical to the rejections pending at the time Applicants appealed the Final Rejection. And although the Office Action rejects claims 4-6 and 8-11 as being obvious over Voyer in view of Nakano, the Office Action does not actually apply Nakano in the rejections and does not indicate that a modification of Voyer's teachings is necessary to achieve the claimed subject matter. Thus, claims 4-6 a and 8-11 are actually rejected as being anticipated by or obvious over Voyer standing alone. Accordingly, the pending rejections of claims 2-11 are identical to those pending at the time of Applicants' appeal.

The OfficeAction's reinstituting examination after filing of an appeal brief and application of new bases for rejecting claims 2-11 in the January 11, 2008, office action acknowledges that claims 2-11 are patentable over the teachings of Voyer, Nakano, and Kumar, as applied in the Final Rejection and identically applied in the present Office Action. Thus, the Applicants submit that the reinstatement of the same rejections is inappropriate in light of the prior acknowledgement that the rejections were unwarranted.

Moreover, by issuing the present office action, the Office has denied Applicants the due process of law by refusing Applicants the opportunity to have these rejections considered by the Board in an appeal.

General Subject Matter Distinguishing Claims 2-5, 8 and 11

Claim 2 defines a transmit power control (TPC) method for controlling the transmit power of a downlink common channel based on TPC commands received from a plurality of mobile stations. According to this method, each mobile station communicates first TPC commands for a downlink common channel and second TPC commands for a downlink dedicated channel.

The Office Action proposes that Voyer discloses that each of a plurality of mobile stations transmits a downlink common channel TPC command, TPC_1 , and a downlink dedicated channel TPC command, TPC_2 , to a base station (see Office Action page 3, lines 6-11).

By contrast to the Office Action's proposal, though, Voyer discloses, in Figs. 1-3, that each mobile station SM_i communicates a transmit power command signal TPC_i to a base station (see Voyer paragraph [0004], lines 5-8). Thus, Voyer clearly discloses that TPC_1 is communicated by mobile station SM_1 , TPC_2 is communicated by mobile station SM_2 , and TPC_n is communicated by mobile station SM_n . Voyer does not disclose that TPC_1 and TPC_2 are communicated by the same mobile station, as proposed in the Office Action, and does not disclose that TPC_1 is a downlink common channel TPC command and that TPC_2 is a downlink dedicated channel TPC command, as similarly proposed in the Office Action.

Nakano discloses, in Fig. 7, that a layer-1 downlink power control signal control signal is communicated from mobile station 5 to base stations 1 and 2 (see Nakano col. 6, lines 31-37) and an additional downlink power control signal is communicated from a base station control station 11 to base stations 1 and 2 (see col. 6, lines 44-50). Thus, Nakano similarly does not disclose a mobile station that communicates two different types of power control signals. More specifically,

Nakano does not disclose the claimed subject matter of a mobile station that transmits a first TPC command for a downlink common channel and a second TPC command for a downlink dedicated channel TPC command to a base station through an uplink dedicated channel. As a result, Nakano does not supplement the teachings of Voyer in this regard.

Accordingly, the Applicants submit that the teachings of Voyer and Nakano, considered individually or in combination, do not render obvious the subject matter defined by claim 2. Claims 2-5, 8 and 11 similarly recite the above-mentioned subject matter distinguishing method claim 2 from the applied references, although claim 11 does so with respect to an apparatus.

Specific Subject Matter Distinguishing Claims 2 and 3

The Office Action acknowledges that Voyer does not disclose having a mobile station communicate first TPC commands, used for power controlling a downlink common channel, and second TPC commands, used for power controlling a downlink dedicated channel, such that the transmission interval of the first TPC commands is longer than that of the second TPC commands (see Office Action page 3, penultimate paragraph, through page 4, line 10). To overcome this deficiency, the Office Action proposes that Nakano discloses one form of transmission power control having a longer interval than another form of transmission power control (see page 3, last line, through page 4, line 3).

However, Nakano discloses that transmission power control commands used for site diversity operations are communicated at longer intervals than when such commands are used during non-site diversity operations (see Nakano Fig. 9 and col. 7, lines 13-23). Site diversity communication is a technique in which multiple base stations communicate the same payload

information to a mobile station on different channels to increase the likelihood that the mobile station will correctly receive the payload information (see col. 1, lines 26-31). Site diversity operation is capable of satisfying a given communication quality using less transmission power, so that interference among base stations can be reduced and communication capacity can be increased (see col. 1, lines 31-35).

Thus, Nakano discloses increasing the frequency of transmission power control when receiving payload information from a single base station and decreasing the frequency of transmission power control when receiving the same payload information from multiple base stations. Nakano discloses that it is necessary to decrease the frequency of transmission power control during site diversity operation because a central control station must coordinate the transmission power control for all of the base stations and extra transmission and processing time are required to communicate the transmission power control information among the mobile station, base station, exchange station, and control station (see Figs. 3 and 9, and col. 2, lines 52-58).

Nakano does not disclose a downlink common channel or distinguish such from a downlink dedicated channel. Thus, contrary to the Office Action's proposal, Nakano provides no motivation to modify Voyer's system to communicate power control commands more frequently for a dedicated channel than for a common channel, as recited in claim 2. At most, Nakano may provide motivation to modify Voyer's system to communicate power control commands more frequently for non-site diversity operation than for site diversity operation. However, diversity/non-diversity operations are not similar to dedicated/common channel operations.

The Office Action proposes that Nakano provides the motivation for modifying Voyer's system to achieve the claimed subject matter because of "the effect of the downlink transmission power control that can follow a variation in propagation loss and control frame error rate ... over a downlink common channel used to simultaneously transmit [the] same data to a plurality of mobile stations" (see Office Action paragraph bridging pages 4 and 5).

However, Nakano does not disclose a downlink common channel used to simultaneously transmit the same data to a plurality of mobile stations, as proposed in the Office Action. As a result, it necessarily follows that Nakano cannot disclose an "effect of downlink power control" that can follow a variation in propagation loss and control frame error rate in such a downlink common channel, as proposed in the Office Action.

Moreover, the Office Action does not identify how a transmission interval between first TPC commands that is longer than that between second TPC commands better or uniquely achieves the proposed benefit of "the effect of downlink power control that can follow a variation in propagation loss and control frame error rate." A skilled artisan finds motivation to modify a reference based on the teachings of another only when a benefit is foreseen by the modification. The Office Action fails to indicate: (1) why or how a longer interval for communicating first TPC commands than for communicating second TPC commands produces the putative effect of downlink power control that can follow a variation in propagation loss and control frame error rate or (2) why an equal or shorter relative interval would not produce this effect.

In accordance with the above discussion, the combined teachings of Voyer and Nakano provide no motivation to modify Voyer's system to achieve the claimed subject matter. Specifically, the references provide no motivation to modify Voyer's system such that each of a

plurality of mobile stations communicates first TPC commands for a downlink common channel and second TPC commands for a downlink dedicated channel and the transmission interval between the first TPC commands is longer than the transmission interval between the second TPC commands.

Accordingly, the combined teachings of Voyer and Nakano, considered individually or in combination, do not render obvious the subject matter defined by claim 2. Therefore, allowance of claim 2 is warranted for this independent reason.

Independent claim 3 differs from claim 2 in that the communications of the first and second TPC commands are characterized by their numbers of occurrence within a frame rather than their interval. Whether the communications of the first and second TPC commands are characterized by their numbers of occurrence within a frame or their interval, the analysis provided above for distinguishing the claimed subject matter from the applied references continues to hold. Thus, for reasons similar to those discussed in connection with claim 2, Voyer and Nakano do not render obvious the subject matter defined by claim 3. Therefore, allowance of claim 3 is warranted for this independent reason.

Specific Subject Matter Distinguishing Claim 4

Claim 4 defines a TPC method for concurrently controlling the transmit powers of: (1) a downlink common channel based on received first TPC commands and (2) downlink dedicated channels based on received second TPC commands. Both the first and second TPC commands are transmitted in the same time slot by each of a plurality of mobile stations.

The Office Action proposes that Voyer discloses, in paragraph 2, mobile stations that transmit first and second TPC commands within the same time slot (see Office Action page 6, lines 4-6).

By contrast to the Office Action's proposal, though, Voyer discloses that a composite signal transmitted by a base station comprises all of the dedicated signals (i.e., dedicated channels) and specific signals (i.e., common channels) for the base station's coverage area (see Voyer paragraph [0002], lines 1-6). Each of the dedicated channels is communicated to a respective mobile station and the common channels are communicated to all mobile stations within the base station's coverage area (see paragraph [0002], lines 4-6).

Voyer does not disclose in the cited paragraph that the mobile stations transmit any information, contrary to the Office Action's proposal; thus, it necessarily follows that Voyer cannot disclose, in the cited material, the claimed subject matter of mobile stations that each transmit first and second TPC commands. Although Voyer discloses in other sections of the specification that the mobile stations each communicate a power command signal TPC to a base station, Voyer does not disclose, for the reasons discussed below, that a mobile station communicates two power command signals within an uplink channel that each regulate a different downlink channel.

Further, although Voyer's base station may multiplex both dedicated channels and common channels into a composite transmission signal using code division multiple access (CDMA) multiplexing (see Voyer paragraph [0002], lines 7-10), such CDMA multiplexing requires each channel to be coded by a different spread code. Since each spread code creates a distinct coded channel within the multiplexed composite signal, it necessarily follows that

Voyer's dedicated and common channels are not transmitted in the same time slot of a single channel, as are the first and second TPC commands recited in claim 4. Moreover, Voyer's dedicated and common channels are not identical, or even similar to, the claimed first and second TPC commands.

Accordingly, Applicants submit that Voyer does not identically disclose or render obvious the subject matter defined by claim 11 and Nakano is not cited for supplementing the teachings of Voyer with regard to claim 4. Specifically, Voyer does not disclose the claimed subject matter of: (1) a plurality of mobile stations that each communicates first and second TPC commands in the same time slot and (2) a base station that controls the transmit power of a downlink common channel based on the received first TPC commands and controls the transmit powers of downlink dedicated channels based on the received second TPC commands. Therefore, allowance of claim 4 is warranted for these independent reasons.

Specific Subject Matter Distinguishing Claims 5 and 9

Claim 5 defines a TPC method for controlling the transmit power of a downlink common channel based on first TPC commands received from a plurality of mobile stations. According to this method, a base station decreases the transmit power of the downlink common channel when all of the received first TPC commands instruct a decrease of the transmit power.

The Office Action proposes that Voyer discloses, in the abstract and paragraphs 4 and 7, decreasing the transmit power of a downlink common channel when the TPC commands received from every mobile station instruct a decrease of the transmit power for this channel (see Office Action page 7, lines 8-12).

An inspection of Voyer's abstract and paragraph 7 unambiguously contravenes the Office Action's assertion that these portions of Voyer's disclosure describe the features for which they are cited. With respect to Voyer's paragraph 4, Voyer discloses a plurality of power control units 14_1 - 14_N that each receive a respective one of TPC command signals TPC_1 - TPC_N communicated by a corresponding mobile station SM_1 - SM_N (see Voyer Fig. 1 and paragraph [0004], lines 8-11). Each power control unit 14_1 - 14_N modifies its corresponding input signal e_1 - e_N based on the corresponding received TPC command signal TPC_1 - TPC_N (see paragraph [0004], lines 11-14).

More specifically, Voyer discloses that power control unit 14_1 modifies input signal e_1 based on received TPC command signal TPC_1 , power control unit 14_2 modifies input signal e_2 based on received TPC command signal TPC_2 , power control unit 14_3 modifies input signal e_3 based on received TPC command signal TPC_3 , ..., and power control unit 14_N modifies input signal e_N based on received TPC command signal TPC_N .

Thus, each of Voyer's power control units 14_1 - 14_N modifies its corresponding input signal based on a TPC command signal received from a single mobile station. More simply, each of Voyer's power control units 14_1 - 14_N receives a TPC command signal from only one mobile station and, thus, can only regulate the power of its corresponding input signal based on this single TPC command signal; Voyer's power control units 14_1 - 14_N cannot regulate the power of the input signal based on TPC command signals received from multiple mobile stations. As a result, it necessarily follows that none of Voyer's power control units 14_1 - 14_N can decrease the transmit power of an input signal only when the TPC commands received from every mobile station instruct a decrease of the transmit power for this input signal.

Accordingly, Voyer does not disclose the claimed subject matter in which a base station decreases the transmit power of a downlink common channel when all of first TPC commands received from a plurality of mobile stations instruct a decrease of the transmit power. Thus, Voyer does not anticipate or render obvious the subject matter defined by claim 5 and Nakano is not cited for supplementing the teachings of Voyer. Independent claim 9 similarly recites the above-mentioned subject matter distinguishing method claim 5 from Voyer, but with respect to an apparatus. Therefore, allowance of claim 5 is warranted for this independent reason and allowance of claim 9 is also warranted.

Furthermore, for the reasons discussed above, Voyer also does not disclose the subject matter recited in claims 5 and 9 of mobiles stations that: (1) each transmit first and second TPC commands and (2) each transmit the first and second TPC commands in the same channel. Therefore, allowance of claims 5 and 9 is warranted for these independent reasons.

Subject Matter Distinguishing Claims 6, 7, and 10

Claim 6 defines a TPC method for controlling the transmit power of a downlink common channel based on TPC commands received from a plurality of mobile stations. According to this method, a base station sets the transmit power of the downlink common channel to the greatest transmit power set, with or without an offset, for any one of a plurality of downlink dedicated channels.

The Office Action proposes that Voyer discloses, in paragraphs 5, 12, 14, and 15, setting the transmit power of a downlink common channel to the greatest transmit power established,

with or without an offset, for any one of a plurality of downlink dedicated channels (see Office Action page 8, last paragraph).

By contrast to the proposed disclosure, though, Voyer discloses that: (1) the sum of the transmission powers for the signals constituting a composite signal must not exceed the desired operating transmission power (see Voyer paragraph [0012] and paragraph [0015], lines 8-11) and (2) the transmission power of a signal communicated to a nearby mobile station should be less than that of a signal communicated to a distant mobile station (see [0015], lines 10-15). Voyer further discloses that these two factors are considered when assigning transmission power to each signal constituting the composite signal (see [0017]).

Other than limiting the combined power of all signals constituting the composite signal, Voyer discloses no relationship between the transmit power assigned to a downlink common channel and that assigned to a downlink dedicated channel. Thus, Voyer cannot disclose the claimed subject matter of setting the transmit power of a downlink common channel to the greatest transmit power established, with or without an offset, for any one of a plurality of downlink dedicated channels.

Accordingly, Voyer does not anticipate or render obvious the subject matter defined by claim 6 and Nakano is not cited for supplementing the teachings of Voyer. Independent claim 10 similarly recites the above-mentioned subject matter distinguishing method claim 6 from Voyer, but with respect to an apparatus. Therefore, the rejection applied to claim 7 is obviated allowance of claims 6, 7, and 10 is warranted.

Specific Subject Matter Distinguishing Claims 8 and 11

Claim 8 defines a TPC method for controlling the transmit power of a downlink common channel based on TPC commands received from a plurality of mobile stations. According to this method, each of a plurality of mobile stations transmits a TPC command for a downlink dedicated channel and a signal indicating an amount of increase of transmit power of the downlink common channel to a base station through an uplink dedicated channel or an uplink random access channel.

The Office Action proposes that Voyer discloses, in the abstract and paragraphs 4 and 7, mobile stations that transmit a TPC command and a signal indicating an amount of increase for the transmit power of a downlink common channel (see Office Action page 8, lines 7-12).

By contrast to the Office Action's proposal, though, Voyer discloses in the abstract that mobile stations each communicate a power command signal to a base station (see Voyer abstract, lines 5-8). Voyer discloses in paragraph 4 that each mobile station SM_i communicates to the base station a command signal TPC_i that represents a request for increase or decrease of the transmission power for a signal (seemingly either a dedicated or a common channel) to be communicated by the base station to the mobile station (see [0004], lines 5-8). Voyer discloses nothing relating to the transmission of a signal by the mobile stations in paragraph 7.

Although Voyer discloses that each mobile station communicates a power command signal TPC to the base station for use in regulating seemingly either a dedicated or a common channel, Voyer does not disclose that a mobile station communicates to a base station both a power command signal TPC for use in regulating the power of a dedicated and another signal for regulating the power of a common channel. Thus, contrary to the Office Action's proposal, it

necessarily follows that Voyer cannot disclose: (1) a mobile station communicating both the power command signal TPC and the other power regulating signal in a single uplink channel and (2) simultaneously controlling both the power of a dedicated channel in accordance with the command signal TPC received from the mobile station and the power of a common channel in accordance with another power command signal received from the same mobile station.

Accordingly, Voyer does not anticipate or render obvious the subject matter defined by claim 8 and Nakano is not cited for supplementing the teachings of Voyer. More specifically, Voyer does not disclose the claimed subject matter of: (1) a plurality of mobile stations that each transmit a TPC command for a downlink dedicated channel and a signal indicating an amount of increase of transmit power for a downlink common channel to a base station through an uplink dedicated channel or an uplink random access channel and (2) the base station controlling the transmit powers of the downlink dedicated channels based on the received TPC commands and increasing the transmit power of the downlink common channel by a received amount of increase of the transmit power. Independent claim 11 similarly recites the above-mentioned subject matter distinguishing method claim 8 from Voyer, but with respect to an apparatus. Therefore, allowance of claims 8 and 11 is warranted for these independent reasons.

Specific Subject Matter Distinguishing Claim 7

For the reasons discussed above in connection with base claim 6, Voyer does not disclose the claimed subject matter whereby a base station sets the transmit power of a downlink common channel to the greatest transmit power set, with an offset, for any one of a plurality of downlink dedicated channels. Kumar does not disclose an offset of any kind. Thus, it necessarily follows

that Kumar cannot disclose decreasing an offset when an ACK signal is received a plurality of times consecutively and increasing the offset when a NACK signal is received a plurality of times consecutively, as proposed in the Office Action (see Office Action page 12, first paragraph).

Accordingly, the conclusions and arguments set forth in the Office Action are unfounded. Thus, Voyer and Kumar do not render obvious the subject matter defined by claim 7. Therefore, allowance of claim 7 is warranted for this independent reason.

In view of the above, it is submitted that this application is in condition for allowance and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

/James Edward Ledbetter/

Date: October 28, 2008
JEL/DWW/att

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